

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2002-217220

(43)Date of publication of application : 02.08.2002

(51)Int.Cl.

H01L 21/56
H05K 3/28
// H03H 3/08
H03H 9/25

(21)Application number : 2001-014175

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(22)Date of filing : 23.01.2001

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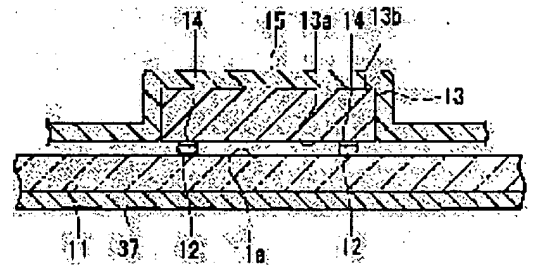
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(54) METHOD FOR MANUFACTURING ELECTRONIC DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To enable a mechanical joint between a connecting electrode of an electronic part and a conductor pattern of a mounting board to be improved in strength and stability through a simple process without having an adverse effect on the operation of the electronic part.

SOLUTION: In a method for manufacturing the electronic device, the electronic part 13 and the mounting board 11 are arranged so as to make one side 13a of the electronic part 13 confront one side 11a of the mounting board 11, and the connecting electrode 14 of the electronic part 13 is electrically and mechanically joined to the conductor pattern 12 of the mounting board 11. Then, a resin film 15 is disposed on the electronic part 13 and the mounting board 11, and the resin film 15 is changed in shape by heating so as to come into close contact with the side 13b of the electronic part 13 opposite to the mounting board 11 and one side 11a of the mounting board 11 around the electronic part 13. Next, the resin film 15 is bonded to the mounting board 11 by heating.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the
examiner's decision of rejection or application]

(19) 日本国特許庁 (J P)

(12) 公開特許公報 (A)

(11) 特許出願公開番号

特開2002-217220

(P2002-217220A)

(43) 公開日 平成14年8月2日 (2002.8.2)

(51) Int.Cl. ⁷	識別記号	F I	テ-マコード* (参考)
H 0 1 L 21/56		H 0 1 L 21/56	R 5 E 3 1 4
H 0 5 K 3/28		H 0 5 K 3/28	G 5 F 0 6 1
			F 5 J 0 9 7
// H 0 3 H 3/08		H 0 3 H 3/08	
9/25		9/25	A
審査請求 未請求 請求項の数4 O L (全 10 頁)			

(21) 出願番号 特願2001-14175 (P2001-14175)

(22) 出願日 平成13年1月23日 (2001.1.23)

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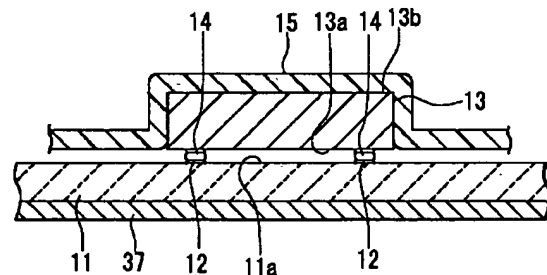
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(54) 【発明の名称】 電子装置の製造方法

(57) 【要約】

【課題】 簡単な工程で、電子部品の動作に影響を与えることなく、電子部品の接続電極と実装基板の導体パターンとの機械的な接合の強度や接合の安定性の向上を図る。

【解決手段】 電子装置の製造方法では、電子部品13の一方の面13aが実装基板11の一方の面11aに対向するように、電子部品13と実装基板11とを配置し、電子部品13の接続電極14を実装基板11の導体パターン12に電気的に接続し且つ機械的に接合する。次に、電子部品13および実装基板11の上に樹脂フィルム15を配置し、樹脂フィルム15を加熱して、電子部品13の実装基板11とは反対側の面13bと電子部品13の周辺の部分における実装基板11の一方の面11aとに密着するように樹脂フィルム15の形状を変化させる。次に、樹脂フィルム15を加熱して実装基板11に接着する。



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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the manufacture approach of the electronic instrument equipped with a mounting substrate and the electronic parts mounted in this mounting substrate.

[0002]

[Description of the Prior Art] As for a surface acoustic element, the Kushigata electrode is formed in one field of a piezo-electric substrate. This surface acoustic element is widely used for the filter in mobile communication equipment, such as a cellular phone, etc.

[0003] By the way, electronic parts, such as semi-conductor components, are used in many cases with the gestalt of the package which has the structure where electronic parts were mounted on the mounting substrate, and the conductor pattern of a mounting substrate was electrically connected with the connection electrode of electronic parts, and the closure of the electrical installation part of the connection electrode of electronic parts and the conductor pattern of a mounting substrate was carried out. It is also the same as when electronic parts are surface acoustic elements. In addition, in this application, the thing equipped with a mounting substrate and the electronic parts mounted in this mounting substrate is called electronic instrument.

[0004] In an electronic instrument, it roughly divides into the electrical installation approach of the connection electrode of electronic parts, and the conductor pattern of a mounting substrate, and there are face down bonding which arranges electronic parts so that the field which has the connection electrode of electronic parts may turn to a mounting substrate, and face up bonding to which the field which has the connection electrode of electronic parts arranges electronic parts so that a mounting substrate may turn to the opposite side in it. For the miniaturization of an electronic instrument, the face down bonding is more advantageous.

[0005] It is common for it to be filled up with under-filling material between electronic parts and a mounting substrate, and to close the electrical installation part of the connection electrode of electronic parts and the conductor pattern of a mounting substrate by the manufacture approach of the conventional electronic instrument which adopted face down bonding, after connecting electrically the connection electrode of electronic parts and the conductor pattern of a mounting substrate.

[0006] However, since there is a problem peculiar to a surface acoustic element when electronic parts are surface acoustic elements, the above general approaches are not then used. A problem peculiar to a surface acoustic element is making it the resin for the closures etc. not contact the surface acoustic wave propagation field in the front face of a surface acoustic element, as the Kushigata electrode is formed in that front face, and actuation of a surface acoustic element is not affected in a surface acoustic element, while it is necessary to close a surface acoustic element so that foreign matters, such as moisture and dust, may not adhere to this Kushigata electrode.

[0007] Therefore, as the manufacture approach of an electronic instrument in case electronic parts are surface acoustic elements conventionally, after connecting electrically the connection electrode of a surface acoustic element, and the conductor pattern of a mounting substrate, the method of enclosing a surface acoustic element and performing the closure by the structure like the cap formed by the ceramic metallurgy group etc., was used, for example. As the manufacture approach of others of an electronic instrument in case electronic parts are surface acoustic elements, after connecting electrically the connection electrode of a surface acoustic element, and the conductor pattern of a mounting substrate, there is a method of enclosing the perimeter of a surface acoustic element by side philharmonic material, and performing the closure.

[0008]

[Problem(s) to be Solved by the Invention] By the approach of enclosing a surface acoustic element and performing the closure by the structure like a cap among the manufacture approaches of an electronic instrument in case electronic parts are surface acoustic elements, there is a trouble that the miniaturization of an electronic instrument is difficult. Moreover, by this approach, the above-mentioned structure has the trouble that improvement in the reinforcement of

the mechanical junction to the connection electrode of a surface acoustic element and the conductor pattern of a mounting substrate or the stability of junction cannot be aimed at in order not to contribute to mechanical junction to the connection electrode of a surface acoustic element, and the conductor pattern of a mounting substrate.

[0009] Moreover, by the approach of enclosing the perimeter of a surface acoustic element by side philharmonic material among the manufacture approaches of an electronic instrument in case electronic parts are surface acoustic elements, and performing the closure, there is a trouble that there is a possibility that side philharmonic material may enter the surface acoustic wave propagation field in the front face of a surface acoustic element.

[0010] In addition, also in the case of RF passive circuit elements [vibrator or], not only a surface acoustic element but electronic parts may affect actuation of electronic parts, if the resin for the closures etc. contacts the front face of electronic parts. Therefore, the above-mentioned trouble is the same not only when electronic parts are surface acoustic elements, but about the case where electronic parts are vibrator and RF passive circuit elements.

[0011] This invention was made in view of this trouble, that 1st purpose is the manufacture approach of the electronic instrument equipped with a mounting substrate and the electronic parts mounted in this mounting substrate, and is an easy process, and it is for providing about the manufacture approach of an electronic instrument of having enabled it to aim at improvement in the reinforcement of the mechanical junction to the connection electrode of electronic parts, and the conductor pattern of a mounting substrate, or the stability of junction, without affecting actuation of electronic parts.

[0012] The 2nd purpose of this invention is to offer the manufacture approach of the electronic instrument which enabled it to close electronic parts, without in addition to the 1st purpose of the above, being an easy process and affecting actuation of electronic parts.

[0013]

[Means for Solving the Problem] The mounting substrate which has the conductor pattern which exposes the manufacture approach of the electronic instrument of this invention in one field, It is arranged so that the field which has a connection electrode in one field and has this connection electrode may counter one field of a mounting substrate. So that a connection electrode is electrically connected to the conductor pattern of a mounting substrate, and it may be the approach of manufacturing the electronic instrument equipped with the electronic parts joined mechanically and one field of electronic parts may counter one field of a mounting substrate The process which arranges electronic parts and a mounting substrate and is joined mechanically [connect the connection electrode of electronic parts to the conductor pattern of a mounting substrate electrically and], The process which arranges a resin film so that electronic parts and a mounting substrate may be covered, and by softening a resin film It has the process to which the configuration of a resin film is changed, and the process which pastes up a resin film on a mounting substrate so that a resin film may stick to the field of the opposite side, and one field of the mounting substrate in the surrounding part of electronic parts with the mounting substrate of electronic parts and may cover electronic parts and a mounting substrate.

[0014] By the manufacture approach of the electronic instrument of this invention, with the mounting substrate of electronic parts, a resin film covers electronic parts and a mounting substrate so that it may stick to the field of the opposite side, and one field of the mounting substrate in the surrounding part of electronic parts, and it pastes them up on a mounting substrate. And the mechanical junction to the connection electrode of electronic parts and the conductor pattern of a mounting substrate is reinforced with this resin film.

[0015] In the manufacture approach of the electronic instrument of this invention, a resin film may close electronic parts. Moreover, in the manufacture approach of the electronic instrument of this invention, space may be formed between one field of electronic parts, and one field of a mounting substrate.

[0016] Moreover, in the manufacture approach of the electronic instrument of this invention, the process which pastes up a resin film may paste up a resin film on a mounting substrate by stiffening a resin film, after heating a resin film and making it a resin film have a fluidity.

[0017]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained to a detail with reference to a drawing. First, with reference to drawing 1 , the configuration of the electronic instrument with which the gestalt of 1 operation of this invention is applied is explained. The mounting substrate 11 which has the conductor pattern 12 which exposes the electronic instrument 10 in the gestalt of this operation in one field 11a, It is arranged so that field 13a which has the connection electrode 14 in one field 13a, and has this connection electrode 14 may counter one field 11a of the mounting substrate 11. The electronic parts 13 joined mechanically [the connection electrode 14 is electrically connected to the conductor pattern 12 of the mounting substrate 11, and], In the mounting substrate 11 of electronic parts 13, electronic parts 13 and the mounting substrate 11 were covered so that it might stick to field 13b of the opposite side, and one field 11a of the mounting substrate 11 in the surrounding part of electronic parts 13, and it has the resin film 15 adhered to the mounting substrate 11.

[0018] The mounting substrate 11 is formed with glass, resin, or a ceramic. Although electronic parts 13 are a surface

acoustic element, vibrator, RF passive circuit elements, etc., they may be other electronic parts. Electronic parts 13 are mounted in the mounting substrate 11 by the face down bonding arranged so that field 13a which has the connection electrode 14 may turn to the mounting substrate 11 as mentioned above. Space 16 is formed between one field 13a of electronic parts 13, and one field 11a of the mounting substrate 11.

[0019] Field 13b of the opposite side is covered without the clearance with the resin film 15 in the mounting substrate 11 of electronic parts 13. The surrounding part of electronic parts 13 is also covered with the resin film 15 without the clearance among one field 11a of the mounting substrate 11. Moreover, the resin film 15 is closing the whole electronic parts 13 including the electrical installation part of the connection electrode 14 of electronic parts 13, and the conductor pattern 12 of the mounting substrate 11.

[0020] The resin film 15 is formed with thermosetting resin, such as an epoxy resin. The thickness of the resin film 15 is 50-150 micrometers.

[0021] Next, the outline of the manufacture approach of the electronic instrument 10 concerning the gestalt of this operation is explained. The manufacture approach of this electronic instrument 10 so that one field 13a of electronic parts 13 may counter one field 11a of the mounting substrate 11. The process which arranges electronic parts 13 and the mounting substrate 11, and is joined mechanically [connect the connection electrode 14 of electronic parts 13 to the conductor pattern 12 of the mounting substrate 11 electrically, and], The resin film 15 is arranged so that it may stick to one field 11a of the mounting substrate [in / in the mounting substrate 11 of electronic parts 13 / field 13b of the opposite side, and the surrounding part of electronic parts 13] 11 and electronic parts 13 and the mounting substrate 11 may be covered. It has the process which pastes up the resin film 15 on the mounting substrate 11.

[0022] Next, with reference to drawing 2, an example of the property of the resin film 15 used in the gestalt of this operation is explained notionally. In drawing 2, the white round head and the continuous line show the correspondence relation between the temperature of the resin film 15, and the die length about the direction of arbitration. Moreover, in drawing 2, the black dot and the broken line show the correspondence relation between the temperature in the resin whose configuration is stable to a temperature change like BT (Bismaleimide triazine) resin for the comparison with the property of the resin film 15, and the die length about the direction of arbitration. By the resin whose configuration is stable to a temperature change, as the sign 110 showed, die length changes almost linearly to a temperature change.

[0023] The resin film 15 is maintaining the film configuration, when the temperature is ordinary temperature (room temperature) RT. If the temperature of the resin film 15 is raised from ordinary temperature RT to glass-transition-temperature TG and it goes as the sign 101 showed, the resin film 15 will expand so that die length may change almost linearly to a temperature change, while softening gradually. If the temperature of the resin film 15 is raised from glass-transition-temperature TG to the hardening initiation temperature HT and it goes as the sign 102 showed, the resin film 15 will expand rapidly while coming to have a fluidity. If temperature of the resin film 15 is carried out to beyond the hardening initiation temperature HT as the sign 103 showed, it is begun to harden the resin film 15. After hardening of the resin film 15 is completed, as the sign 104 showed, the resin film 15 is contracted. At this time, the force (henceforth a shrinkage force) of the direction to contract arises on the resin film 15. After hardening of the resin film 15 is completed, as the sign 105 showed, the configuration of the resin film 15 is stable to a temperature change, without softening or having a fluidity again, even if it raises temperature. Although the hardening initiation temperature HT changes with properties of the resin film 15, it is about 150-200 degrees C, for example, and, in the case of the resin film 15 formed using the epoxy resin, is around 150 degrees C. Moreover, the time amount required by hardening termination from hardening initiation of the resin film 15 also changes with properties of the resin film 15.

[0024] In addition, the property of the resin film 15 shown in drawing 2 is notional strictly. If it follows, for example, the temperature variation per unit time amount changes, the property of the resin film 15 will also change.

[0025] By the manufacture approach of the electronic instrument 10 concerning the gestalt of this operation, the configuration of the resin film 15 is changed so that the resin film 15 may stick to field 13b of the opposite side, and one field 11a of the mounting substrate 11 in the surrounding part of electronic parts 13 in the mounting substrate 11 of electronic parts 13 at homogeneity and may cover electronic parts 13 and the mounting substrate 11, where it raised the temperature of the resin film 15 and the resin film 15 is softened. Then, after raising the temperature of the resin film 15 further and making it the resin film 15 have a fluidity, while pasting up the resin film 15 on the mounting substrate 11 by stiffening the resin film 15, the configuration of the resin film 15 is fixed. In case the resin film 15 hardens, a shrinkage force occurs as mentioned above. The shrinkage force of this resin film 15 acts so that electronic parts 13 may be pushed against the mounting substrate 11 side. Thereby, the mechanical junction to the connection electrode 14 of electronic parts 13 and the conductor pattern 12 of the mounting substrate 11 is reinforced more certainly. Moreover, when the resin film 15 contracts, the resin film 15 is more closely stuck to electronic parts 13 and the mounting substrate 11.

[0026] In addition, with the gestalt of this operation, where the resin film 15 is softened in the temperature below glass transition temperature, the configuration of the resin film 15 may be determined and the resin film 15 may be stiffened over comparatively long time amount after that in the temperature below glass transition temperature.

[0027] Moreover, instead of raising the temperature of the resin film 15 and softening the resin film 15, when the resin film 15 is formed with the resin softened by ultraviolet rays, ultraviolet rays may be irradiated at the resin film 15, and the resin film 15 may be softened. Or while raising the temperature of the resin film 15, ultraviolet rays may be irradiated at the resin film 15, and the resin film 15 may be softened.

[0028] Moreover, instead of raising the temperature of the resin film 15 and stiffening the resin film 15, when the resin film 15 is formed with the resin hardened by ultraviolet rays, ultraviolet rays may be irradiated at the resin film 15, and the resin film 15 may be stiffened. Or while raising the temperature of the resin film 15, ultraviolet rays may be irradiated at the resin film 15, and the resin film 15 may be stiffened.

[0029] By the way, in the gestalt of this operation, various approaches can be used as the electrical installation of the connection electrode 14 of electronic parts 13, and the conductor pattern 12 of the mounting substrate 11, and the approach of mechanical junction. Hereafter, some examples of the electrical installation of the connection electrode 14 of electronic parts 13 and the conductor pattern 12 of the mounting substrate 11 and the approach (only henceforth the junction approach) of mechanical junction are explained.

[0030] First, with reference to drawing 3 thru/or drawing 5, the example of the conventional junction approach is explained for the comparison with the gestalt of this operation. In addition, in drawing 3 thru/or drawing 5, the electrical installation of the connection electrode 14 of electronic parts 13 and the conductor pattern 12 of the mounting substrate 11 and the part of mechanical junction are greatly drawn compared with other parts.

[0031] In the example shown in drawing 3, as a connection electrode 14 of electronic parts 13, it connected with the conductor pattern 17 of electronic parts 13, for example, bump 14A which consists of gold is prepared. On the other hand, some conductor patterns 12 are made, for example, connection 12A which consists of gold is prepared in the mounting substrate 11 side. In this example, metal junction of bump 14A and the connection 12A is carried out, and thereby, bump 14A and connection 12A are mechanically joined while connecting electrically.

[0032] In the example shown in drawing 4, as a connection electrode 14 of electronic parts 13, it connected with the conductor pattern 17 of electronic parts 13, for example, bump 14B which consists of gold is prepared. On the other hand, some conductor patterns 12 are made, for example, connection 12A which consists of gold is prepared in the mounting substrate 11 side. In this example, bump 14B and connection 12A are electrically connected by the conductive paste 18. Then, it fills up with the under-filling material 19 between electronic parts 13 and the mounting substrate 11, and mechanical junction of bump 14B, the conductive paste 18, and connection 12A is stably secured according to the shrinkage force of this under-filling material 19.

[0033] In the example shown in drawing 5, as a connection electrode 14 of electronic parts 13, it connected with the conductor pattern 17 of electronic parts 13, for example, bump 14A which consists of gold is prepared. On the other hand, some conductor patterns 12 are made, for example, connection 12A which consists of gold is prepared in the mounting substrate 11 side. In this example, bump 14A and connection 12A are arranged so that it may touch mutually, and thereby, bump 14A and connection 12A are connected electrically. Between the electronic parts 13 and the mounting substrates 11 in the perimeter of bump 14A and connection 12A, the non-conductive or anisotropy conductive paste 20 for junction is poured in. And the mechanical junction to bump 14A and connection 12A is stably secured according to the shrinkage force of this paste 20 for junction.

[0034] Next, with reference to drawing 6 thru/or drawing 8, the example of the junction approach in the gestalt of this operation is explained. In addition, in drawing 6 thru/or drawing 8, the electrical installation of the connection electrode 14 of electronic parts 13 and the conductor pattern 12 of the mounting substrate 11 and the part of mechanical junction are greatly drawn compared with other parts.

[0035] Like the example shown in drawing 3, as a connection electrode 14 of electronic parts 13, it connected with the conductor pattern 17 of electronic parts 13, for example, bump 14A which consists of gold is prepared in the example shown in drawing 6. On the other hand, some conductor patterns 12 are made, for example, connection 12A which consists of gold is prepared in the mounting substrate 11 side. Metal junction of bump 14A and the connection 12A is carried out, and thereby, bump 14A and connection 12A are mechanically joined while connecting electrically. In this example, the resin film 15 in the gestalt of this operation is formed further. And the mechanical junction to bump 14A and connection 12A is reinforced according to the shrinkage force of this resin film 15.

[0036] Like the example shown in drawing 4, as a connection electrode 14 of electronic parts 13, it connected with the conductor pattern 17 of electronic parts 13, for example, bump 14B which consists of gold is prepared in the example shown in drawing 7. On the other hand, some conductor patterns 12 are made, for example, connection 12A which consists of gold is prepared in the mounting substrate 11 side. Bump 14B and connection 12A are electrically connected by the conductive paste 18. In this example, the resin film 15 in the gestalt of this operation is formed further. And mechanical junction of bump 14B, the conductive paste 18, and connection 12A is stably secured according to the shrinkage force of the resin film 15, without using the under-filling material 19.

[0037] Like the example shown in drawing 5, as a connection electrode 14 of electronic parts 13, it connected with the conductor pattern 17 of electronic parts 13, for example, bump 14A which consists of gold is prepared in the example

shown in drawing 8. On the other hand, some conductor patterns 12 are made, for example, connection 12A which consists of gold is prepared in the mounting substrate 11 side. Bump 14A and connection 12A are arranged so that it may touch mutually, and thereby, bump 14A and connection 12A are connected electrically. Between the electronic parts 13 and the mounting substrates 11 in the perimeter of bump 14A and connection 12A, the non-conductive or anisotropy conductive paste 20 for junction is poured in. And the mechanical junction to bump 14A and connection 12A is stably secured according to the shrinkage force of this paste 20 for junction. In this example, the resin film 15 in the gestalt of this operation is formed further. And the mechanical junction to bump 14A and connection 12A is reinforced according to the shrinkage force of this resin film 15.

[0038] In addition, most conventional junction approaches not only in what was shown in drawing 6 thru/or drawing 8 but face down bonding can be used for the junction approach in the gestalt of this operation.

[0039] Next, with reference to drawing 9, an example of surface acoustic element 13A as electronic parts 13 is explained. Surface acoustic element 13A shown in drawing 9 R> 9 has the piezo-electric substrate 21, the Kushigata electrode 22 and conductor pattern 23 which were formed in one field of this piezo-electric substrate 21, and the connection electrode 24 formed in the edge of a conductor pattern 23. The connection electrode 24 is equivalent to the connection electrode 14 in drawing 1 etc. Surface acoustic element 13A is a component which uses the surface acoustic wave generated by the Kushigata electrode 22 for basic actuation, and has a function as a band pass filter with the gestalt of this operation.

[0040] In drawing 9, the connection electrode 24 which attached the notation "IN" is an input terminal, the connection electrode 24 which attached the notation "OUT" is an output terminal, and the connection electrode 24 which attached the notation "GND" is an earth terminal. Moreover, in drawing 9, the field surrounded with the broken line shown with a sign 25 is a field which has the need of making it a sealing agent etc. not enter into the inside, including a surface acoustic wave propagation field.

[0041] Next, with reference to drawing 10 thru/or drawing 14, the manufacture approach of the electronic instrument 10 concerning the gestalt of this operation is explained in detail. With the gestalt of this operation, you may manufacture one electronic instrument 10 at a time, and two or more electronic instruments 10 may be manufactured to coincidence. Below, the case where two or more electronic instruments 10 are manufactured to coincidence is explained.

[0042] By the manufacture approach of the electronic instrument concerning the gestalt of this operation, first, as shown in drawing 10, electronic parts 13 are arranged on the mounting substrate 11, and the connection electrode 14 of electronic parts 13 is electrically connected to the conductor pattern 12 of the mounting substrate 11, and it joins mechanically so that one field 13a of electronic parts 13 may counter one field 11a of the mounting substrate 11. Next, the resin film 15 formed in the almost same flat-surface configuration as the configuration of one field 11a of the mounting substrate 11 is arranged so that electronic parts 13 and the mounting substrate 11 may be covered.

[0043] In addition, the mounting substrate 11 in drawing 10 contains the part corresponding to two or more electronic parts 13. And on this mounting substrate 11, two or more electronic parts 13 are arranged.

[0044] Next, as shown in drawing 11, the configuration of the resin film 15 is changed with the self-weight of the resin film 15 so that the resin film 15 is heated, the resin film 15 is softened, and the resin film 15 may stick to field 13b of the opposite side, and one field 11a of the mounting substrate 11 in the surrounding part of electronic parts 13 in the mounting substrate 11 of electronic parts 13 and may cover electronic parts 13 and the mounting substrate 11. It is made for the temperature of the resin film 15 at this time to become lower than the temperature which the resin film 15 hardens.

[0045] In addition, instead of raising the temperature of the resin film 15 and softening the resin film 15, when the resin film 15 is formed with the resin softened by ultraviolet rays, ultraviolet rays may be irradiated at the resin film 15, and the resin film 15 may be softened. Or while raising the temperature of the resin film 15, ultraviolet rays may be irradiated at the resin film 15, and the resin film 15 may be softened.

[0046] Thus, the configuration of the resin film 15 can be easily determined by softening the resin film 15 and changing the configuration of the resin film 15.

[0047] With the gestalt of this operation, the heater 37 at which the mounting substrate 11 is laid is used as a means to heat the resin film 15. However, other means may be used as a means to heat. A heater 37 heats the mounting substrate 11 and the resin film 15.

[0048] Next, as shown in drawing 12, the mounting substrate 11 and the resin film 15 are heated at a heater 37, and it carries out to beyond the temperature to which the resin film 15 hardens the temperature of the resin film 15. After making it have a fluidity for the resin film 15, while making it harden and pasting up the resin film 15 on the mounting substrate 11 by this, the configuration of the resin film 15 is fixed.

[0049] In addition, instead of raising the temperature of the resin film 15 and stiffening the resin film 15, when the resin film 15 is formed with the resin hardened by ultraviolet rays, ultraviolet rays may be irradiated at the resin film 15, and the resin film 15 may be stiffened. Or while raising the temperature of the resin film 15, ultraviolet rays may be

irradiated at the resin film 15, and the resin film 15 may be stiffened.

[0050] Next, as shown in drawing 13, the mounting substrate 11 and the resin film 15 are cut, and each electronic instrument 10 is completed in the cutting location shown with the sign 41. Drawing 14 R> 4 is the top view showing the mounting substrate 11 in front of the cutting process shown in drawing 13, electronic parts 13, and the resin film 15. The manufacture approach in the case of manufacturing one electronic instrument 10 at a time is the same as that of the case where two or more electronic instruments 10 are manufactured to coincidence, except the process which cuts the above-mentioned mounting substrate 11 and the above-mentioned resin film 15 becoming unnecessary.

[0051] As explained above, by the manufacture approach of the electronic instrument 10 concerning the gestalt of this operation, in the mounting substrate 11 of electronic parts 13, the resin film 15 covers electronic parts 13 and the mounting substrate 11 so that it may stick to field 13b of the opposite side, and one field 11a of the mounting substrate 11 in the surrounding part of electronic parts 13, and pastes the mounting substrate 11. And the mechanical junction to the connection electrode 14 of electronic parts 13 and the conductor pattern 12 of the mounting substrate 11 is reinforced with this resin film 15. Moreover, under-filling material is not filled up with the gestalt of this operation between electronic parts 13 and the mounting substrate 11. Therefore, according to the gestalt of this operation, improvement in the reinforcement of the mechanical junction to the connection electrode 14 of electronic parts 13 and the conductor pattern 12 of the mounting substrate 11 or the stability of junction can be aimed at at an easy configuration and an easy process, without affecting actuation of electronic parts 13.

[0052] By stiffening the resin film 15, after heating the resin film 15 and making it the resin film 15 have a fluidity in the process which pastes up the resin film 15 especially When pasting up the resin film 15 on the mounting substrate 11, the reinforcement of the mechanical junction to the connection electrode 14 of electronic parts 13 and the conductor pattern 12 of the mounting substrate 11 and the stability of junction can be more certainly raised according to the shrinkage force at the time of hardening of the resin film 15.

[0053] Moreover, according to the gestalt of this operation, since the closure of the electronic parts 13 is carried out with the resin film 15, electronic parts 13 can be closed at an easy configuration and an easy process, without affecting actuation of electronic parts 13. Thereby, the resistance of the electronic instrument 10 to an environment etc. is securable.

[0054] Moreover, according to the gestalt of this operation, since space 16 is formed between one field 13a of electronic parts 13, and one field 11a of the mounting substrate 11, when one field 13a of electronic parts 13 contacts other objects, it can prevent that actuation of electronic parts 13 is influenced. In the case of a surface acoustic element, vibrator, or RF passive circuit elements, especially this has effective electronic parts 13.

[0055] According to the gestalt of this operation from these things, the dependability of an electronic instrument 10 can be raised. Moreover, according to the gestalt of this operation, since the closure of electronic parts 13 is performed using the resin film 15, compared with the case where the closure of electronic parts 13 is performed using the structure like a cap, miniaturization [of an electronic instrument 10], lightweight-izing, and thin shape-ization is attained. Moreover, according to the gestalt of this operation, since the closure of electronic parts 13 is performed using the resin film 15, each above-mentioned effectiveness can be acquired by low cost.

[0056] In addition, this invention is not limited to the gestalt of the above-mentioned implementation, but various modification is possible for it.

[0057]

[Effect of the Invention] As explained above, by the manufacture approach of an electronic instrument according to claim 1 to 4, with the mounting substrate of electronic parts, a resin film covers electronic parts and a mounting substrate so that it may stick to the field of the opposite side, and one field of the mounting substrate in the surrounding part of electronic parts, and pastes them up on a mounting substrate. And the mechanical junction to the connection electrode of electronic parts and the conductor pattern of a mounting substrate is reinforced with this resin film.

Therefore, according to this invention, the effectiveness that improvement in the reinforcement of the mechanical junction to the connection electrode of electronic parts and the conductor pattern of a mounting substrate or the stability of junction can be aimed at is done so at an easy process, without affecting actuation of electronic parts. Moreover, he is trying to change the configuration of a resin film by softening a resin film in this invention so that a resin film may stick to the field of the opposite side, and one field of the mounting substrate in the surrounding part of electronic parts with the mounting substrate of electronic parts and may cover electronic parts and a mounting substrate. Therefore, according to this invention, the effectiveness that the configuration of a resin film can be determined easily is done so.

[0058] Moreover, according to the manufacture approach of an electronic instrument according to claim 2, since the closure of the electronic parts is carried out with a resin film, the effectiveness that electronic parts can be closed is done so at an easy process, without affecting actuation of electronic parts.

[0059] Moreover, according to the manufacture approach of an electronic instrument according to claim 3, since space is formed between one field of electronic parts, and one field of a mounting substrate, when one field of electronic parts contacts other objects, actuation of electronic parts does so the effectiveness that it can prevent being influenced.

[0060]. According to the manufacture approach of an electronic instrument according to claim 4, moreover, the process which pastes up a resin film Since the resin film was pasted up on the mounting substrate by stiffening a resin film after heating a resin film and making it a resin film have a fluidity The effectiveness that the reinforcement of the mechanical junction to the connection electrode of electronic parts and the conductor pattern of a mounting substrate and the stability of junction can be raised more certainly is done so.

[Translation done.]